



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------|-------------|----------------------|---------------------|------------------|
|-----------------|-------------|----------------------|---------------------|------------------|

10/028,871

12/21/2001

Richard T. Behrens

0094-MS-D1A

6339

7590

10/17/2005

Christopher C Winslade
McAndrews Held & Malloy
500 W Madison Street
suite 3400
Chicago, IL 60661

EXAMINER

MEW, KEVIN D

ART UNIT

PAPER NUMBER

2664

DATE MAILED: 10/17/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/028,871

Applicant(s)

BEHRENS ET AL.

Examiner

Kevin Mew

Art Unit

2664

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 21 December 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 8-14 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 8, 9 and 11-13 is/are rejected.
- 7) ☒ Claim(s) 10 and 14 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 12/21/2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

Detailed Action

Specification

1. Applicant is reminded of the proper language and format for an abstract of the disclosure.

The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of 50 to 150 words. It is important that the abstract not exceed 150 words in length since the space provided for the abstract on the computer tape used by the printer is limited. The form and legal phraseology often used in patent claims, such as "means" and "said," should be avoided. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

The language should be clear and concise and should not repeat information given in the title. It should avoid using phrases which can be implied, such as, "The disclosure concerns," "The disclosure defined by this invention," "The disclosure describes," etc.

In particular, the abstract exceeds 150 words in length. Appropriate action is required.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 8-9, 11-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Huber et al. (USP 5,247,254) in view of Huber (USP 5,107,379).

Regarding claim 8, Huber (USP 5,247,254) discloses an integrated circuit synchronous read channel (data separator of the circuitry in Fig. 9, element 67, Fig. 9) for receiving digitized read signals representing digitized samples (data separator receiving the series of digital ones and zeros generated by the pulse detector, col. 11, lines 1-24) of a read signal (sinusoid

waveform) of a magnetic storage device (where the digital ones correspond magnetic flux transitions on the recorded media, col. 11, lines 1-24) and recovering digital data represented (produces the sync data, col. 11, lines 5-24) thereby comprising:

a digital peak detector (pulse detector, element 86, Fig. 9) for detecting characteristics of the digitized read signals indicative of storage media transitions (for converting the sinusoid waveform into a series of digital ones and zeros, where the ones correspond to magnetic flux transitions of the recorded media, col. 11, lines 1-9);

a sequence detector (data separator, element 87, Fig. 9) responsive to the digitized read signals for receiving a stream of the digitized read signals (for receiving the series of digital ones and zeros generated by the pulse detector, col. 11, lines 5-24) and determining a corresponding sequence of binary digital signals likely to be represented thereby (produces the sync data, col. 11, lines 5-24); and

an RLL(d,k) decoder (RLL decoder, element 69, Fig. 9) for providing a run length limited decoded output (produces read channel NRZ data output, col. 11, lines 42-55) by decoding the sequence of binary digital signals from the sequence detector (by decoding the output of digital one and zeros output of the data separator, col. 11, lines 1-24), or to provide a run length limited decoded output by decoding a sequence of binary digital signals from the digital peak detector.

Huber does not explicitly show timing recovery circuitry responsive to the digitized read signals and the output of the digital peak detector to provide a timing control signal for controlling the timing of digitized samples of the read signal.

However, Huber (USP 5,107,379) discloses a circuitry that generates a detent clock such that the sample synchronizer receives this detent clock signal and passes that clock to data synchronizer (col. 8, lines 49-61 and col. 9, lines 14-24).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the read-channel system of Huber (USP 5,247,254) with the teaching of Huber (USP 5,107,379) in providing a time control signal for controlling the timing of the digitized samples of the read signal.

The motivation to do so is to control the amount of signals to be read in a given time and correspondingly a controlled information density will be achieved.

Regarding claim 9, the combined system of Huber (USP 5,247,254) and Huber (USP 5,107,379) discloses all the aspects of the claimed invention set forth in the rejection of claim 8 above. Huber (USP 5,247,254) does not disclose the integrated circuit synchronous read channel of claim 8 further comprising digital pulse shaping filter circuitry for modification of the digitized read signals prior to receipt thereof by at least one of (i) the sequence detector, (ii) digital peak detector and (iii) the timing recovery circuitry. However, Huber (USP 5,107,379) discloses a read-channel detector circuit in which a forward filter 20 is incorporated to provide pulse shaping function prior to the peak detection at comparator 22 (col. 5, lines 16-25, Figs. 1, 3). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the read-channel system of Huber (USP 5,247,254) with the teaching of Huber (USP 5,107,379) in utilizing a pulse shaping filter such that it will provide pulse shaping for the incoming read signal. The motivation to do so is to provide an optimally

shaped waveform such that it will minimize timing errors and intersymbol interference while restricting the bandwidth to maximize signal-to-noise ratio.

Regarding claim 11, Huber (USP 5,247,254) also discloses the integrated circuit synchronous read channel of claim 9 wherein the digital pulse shaping filter circuitry includes variable filter parameters (forward filter 20 includes variable parameters such as bandwidth and the timing constraints of the rising edge of the pulse, col. 4, lines 6-29, 46-55).

Regarding claim 12, Huber (USP 5,247,254) also discloses the integrated circuit synchronous read channel of claim 9 wherein the digital pulse shaping filter circuitry includes programmable filter parameters (forward filter 20 includes programmable parameters such as bandwidth and the timing constraints of the rising edge of the pulse, col. 4, lines 6-29, 46-55, element 20, Fig. 3).

Regarding claim 13, Huber (USP 5,247,254) also discloses the integrated circuit synchronous read channel of claim 9 further comprising spectrum smoothing filter circuitry (shaping filter 20, Fig.) for filtering the digitized read signals prior to processing by the sequence detector (shaping filter eliminates high-order harmonics, col. 6, lines 37-39).

Allowable Subject Matter

3. Claims 10, 14 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter:

In claim 10, discloses the integrated circuit synchronous read channel of claim 9 further comprising delay means for delaying the coupling of the digitized read signals to the timing recovery circuitry to match the delay of the coupling of the digitized read signals to the the digital peak detector, respectively, imposed by the digital pulse shaping filter.

In claim 14, the integrated circuit synchronous read channel of claim 8 wherein the sequence detector processes two digitized read signals at a time, the two digitized read signals representing digitized samples of a read signal of a magnetic storage device during two successive channel bit times.

Conclusion

4. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

US Patent 5,140,620 to Woodward

US Patent 5,416,760 to Masood et al.

US Patent 5,544,180 to Gupta

US Patent 5,420,730 to Moon et al.

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kevin Mew whose telephone number is 571-272-3141. The examiner can normally be reached on 9:00 am - 5:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wellington Chin can be reached on 571-272-3134. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



WELLINGTON CHIN
SUPERVISORY PATENT EXAMINER